

### Abstract

A non-invasive spectral measurement for a target analyte present in a subject's tissue or blood derives spectral shapes corresponding to one or more human variability factors, such as, skin color, from spectra collected from a diverse calibration group of subjects. Another set of spectra are normalized based on the derived spectral shapes to generate a set of corrected spectra. The corrected spectra are then utilized to generate and/or enhance a calibration model for detecting and/or measuring the target analyte from one or more transderamly obtained spectra of a subject.